

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

**PEST MANAGEMENT
(Acre)**

CODE 595

DEFINITION

Utilizing environmentally sensitive prevention, avoidance, monitoring and suppression strategies, to manage weeds, insects, diseases, animals and other organisms (including invasive and non-invasive species), that directly or indirectly cause damage or annoyance.

PURPOSES

This practice is applied as part of a Resource Management System (RMS) to support one or more of the following purposes:

- Enhance quantity and quality of commodities.
- Minimize negative impacts of pest control on soil resources, water resources, air resources, plant resources, animal resources and/or humans.

CONDITIONS WHERE PRACTICE APPLIES

Wherever pests will be managed.

CRITERIA

General Criteria Applicable to All Purposes

A pest management component of a conservation plan shall be developed.

All methods of pest management must comply with Federal, State, and local regulations, including management plans for invasive pest species, noxious weeds and disease vectors. Compliance with the Food Quality Protection Act (FQPA); Federal Insecticide, Fungicide and

Rodenticide Act (FIFRA); Worker Protection Standard (WPS); and Interim Endangered Species Protection Program (H7506C) is required for chemical pest control. Pesticides will be used in compliance with the Illinois Pesticide Act administered by the Illinois Department of Agriculture.

Integrated Pest Management (IPM) that strives to balance economics, efficacy and environmental risk, where available, shall be incorporated into planning alternatives. IPM is a sustainable approach to pest control that combines the use of prevention, avoidance, monitoring and suppression strategies, to maintain pest populations below economically damaging levels, to lessen the potential for resistance development, and to minimize harmful effects of pest control on human health and environmental resources. IPM suppression systems include biological controls, cultural controls, and the judicious use of chemical controls.

Integrated Pest Management methods and economic thresholds for some specific pests are available from the University of Illinois Extension. Information relating to IPM in Illinois is available from the University of Illinois, Integrated Pest Management Web site <http://www.ipm.uiuc.edu/index.html>.

All recommendations for pest control will be in accordance with the appropriate handbooks, where available, through the University of Illinois Extension. Pest thresholds and control recommendations exist for some but not all pests/crops.

An appropriate set of mitigation techniques must be planned and implemented to reduce possible environmental risks of pest management activities in accordance with quality criteria in the local Field Office Technical Guide.

Mitigation techniques include practices such as Filter Strips or Conservation Crop Rotations, and management techniques such as application method or timing. All methods of pest management must be integrated with other components of the conservation plan.

Clients are required to follow pesticide label instructions, University of Illinois Extension recommendations, and Crop Consultant recommendations relating to environmental hazards and site-specific application criteria.

Additional Criteria to Protect Quantity and Quality of Commodities

As an essential component of both commodity-specific IPM and IPM general principles, clients shall use the minimum level of pest control necessary to meet their objectives for commodity quantity and quality.

Note: There are situations such as with invasive, resistant, and/or highly damaging pests where aggressive control strategies are desired in order to eradicate a pest from an area.

Additional Criteria to Protect Soil Resources

In conjunction with other conservation practices, the number, sequence, and timing of tillage operations shall be managed to maintain soil quality and maintain soil loss at or below the soil loss tolerance (T) or any other planned soil loss objective. The current version of approved erosion prediction tools and soil quality rating procedures, if available, will be used to comply with this standard. Clients are to follow pesticide label instructions for limiting pesticide residues in soil that may negatively impact non-target plants, animals and humans.

Additional Criteria to Protect Water Resources

Pest management environmental risks, including the impacts of pesticides in ground and surface water on humans and non-target plants and animals, must be evaluated for all identified water resource concerns. The NRCS Windows Pesticide Screening Tool (WIN-PST) will be used to evaluate soil pesticide interactions in Illinois. Interpretations of Hazard Ratings are divided into 5 classes. These are:

X-Extra High

H-High

I-Intermedidate

L-Low

VL-Very Low

When a chosen alternative has significant potential to negatively impact important water resources, (e.g., WIN-PST "Extra High", "High" or "Intermediate" soil/pesticide human risk ratings in the drainage area of a drinking water reservoir), an appropriate set of mitigation techniques must be put in place to address risks to humans and non-target plants and animals. Selection of mitigating techniques shall be based on site conditions and pesticide loss pathways. Follow pesticide label restrictions regarding soil organic matter, soil pH, soil texture, depth to water table, mixing/loading, and application setback distances from intermittent or perennial stream, sinkholes or wetlands. Clients shall pay special attention to pesticide label instructions for limiting pesticide residues in leachate and/or runoff that may negatively affect non-target plants, animals, and humans.

The number, sequence, and timing of tillage operations shall be managed in conjunction with other sediment control tactics and practices, in order to minimize sediment losses to nearby surface water bodies.

Additional Criteria to Protect Air Resources

Clients shall be encouraged to pay special attention to pesticide label instructions for minimizing volatilization and drift that may negatively affect non-target plants, animals, and humans.

Avoid spray drift by not applying pesticides when wind, rising air masses, and thermal inversions favor drift. Adjust nozzle direction, flow rate, and applicator speed to apply the proper rate.

Additional Criteria to Protect Plant Resources

Clients are to follow pesticide label instructions including those directed at:

- Preventing misdirected pest management control measures that negatively affect plants (e.g., removing pesticide residues

from sprayers before moving to the next crop and properly adjusting cultivator teeth and flame burners).

- Appropriate climatic conditions, crop stage, soil moisture, pH, and organic matter in order to protect plant health.
- Limiting pesticide residues in soil that can carry over and harm subsequent crops.

Additional Criteria to Protect Animal Resources

Clients are to follow pesticide label instructions that minimize negative impacts to domestic animals, wildlife, and aquatic ecosystems.

Additional Criteria to Protect Humans

Clients are to follow pesticide label instructions that minimize negative impacts to humans.

Read and follow all label instructions, local, state, federal regulations regarding posting and field re-entry restrictions on treated fields.

All pesticide users are encouraged to take the Private Pesticide Applicators Training offered by the University of Illinois Extension. Persons planning to purchase, use, or supervise the use of "restricted use" pesticides are required to be certified by the Illinois Department of Agriculture.

Avoid unnecessary exposure to pesticides during mixing, handling, and application by wearing protective clothing and equipment prescribed on the label(s).

Handle pesticides properly to protect the user and the environment. Assure that the pesticide applicator knows the exact of the area to be treated and the potential hazard of spray drift or pesticide movement to sensitive areas.

CONSIDERATIONS

If commodity-specific IPM is not available, the following IPM principles should be considered:

- Prevention, such as using pest-free seeds and transplants, cleaning tillage and harvesting equipment between fields, irrigation scheduling to avoid situations conducive to disease development, etc.
- Avoidance, such as using pest resistant varieties, crop rotation, trap crops, etc.

- Monitoring, such as pest scouting, soil testing, weather forecasting, etc. to help target suppression strategies and avoid routine preventative pest control.
- Suppression, such as cultural, biological, and chemical controls, that can reduce a pest population or its impacts. Chemical controls should be used judiciously in order to minimize environmental risk and the development of pest resistance.

Adequate plant nutrients and soil moisture, including favorable pH and soil conditions, should be available to reduce plant stress, improve plant vigor and increase the plant's overall ability to tolerate pests.

Plan erosion control practices minimize soil loss and runoff that can transport adsorbed and dissolved pesticides to surface water.

Follow currently recommended pesticide programs that consider methods of avoiding pesticide resistance and undesirable shifts in the pest species spectrum.

Design an irrigation water management plan that will minimize environmental risk from pest management practices.

Encourage the use of IPM systems that utilize the most appropriate means of pest management including cultural, biological, and chemical methods.

Base pesticide decisions on characteristics such as water solubility, toxicity to non-target organisms, adsorption, persistence, mode of action, efficiency, and economics.

Consider site characteristics such as slopes, soil, geology, water infiltration, depth to water table, proximity to surface water, and climatic conditions.

PLANS AND SPECIFICATIONS

The pest management component of a conservation plan shall be prepared in accordance with the criteria of this standard and shall describe the requirements for applying the practice to achieve its intended purpose(s).

As a minimum, the pest management component of a conservation plan shall include:

- Plan map and soil map of the managed site(s).

- Location of sensitive resources and setbacks, if applicable.
- Environmental risk analysis, for probable pest management recommendations. The WIN-PST Soil/Pesticide Interaction Loss Potential and Hazard Rating Report will meet the requirement.
- Interpretation of the environmental risk analysis and identification of appropriate mitigation techniques.
- Operation and maintenance requirements.

OPERATION AND MAINTENANCE

The pest management component of a conservation plan shall include appropriate operation and maintenance items for the client. These may include:

- Review and update the plan periodically in order to incorporate new IPM technology, respond to cropping system and pest complex changes, and avoid the development of pest resistance. Revisions may be needed when there is a change in crop rotation or when new pest control techniques become available.
- Maintain mitigation techniques identified in the plan in order to ensure continued effectiveness.
- Develop a safety plan including telephone numbers and addresses of emergency treatment centers for individuals exposed to chemicals and the telephone number for the nearest poison control center. The Illinois Poison Resource Center can be contacted:

Rush-Presbyterian-Saint Luke's Hospital

1653 West Congress Parkway

Chicago, Illinois 60612

Telephone: (312)942-5969

(Within the 312 calling area)

(800)222-1222 (Outside the 312 calling area)

The National Pesticide Information Center (NPIC) telephone number in Corvallis, Oregon may also be given for **non-emergency** information:

1-800-858-7384

Monday - Friday

6:30 a.m. to 4:30 p.m. Pacific Time

For advice and assistance with emergency spills that involve agrichemicals, contact the Illinois Environmental Protection agency at (800) 782-7860.

The national 24-hour CHEMTREC telephone number may also be given:

1-800-424-9300

- Follow label requirements for mixing/loading setbacks from wells, intermittent streams and rivers, natural or impounded ponds and lakes, or reservoirs.
- Post signs according to label directions and/or Federal, State, and local laws around sites that have been treated. Follow restricted entry intervals.
- Dispose of pesticides and pesticide containers in accordance with label directions and adhere to Federal, State, and local regulations.
- Read and follow label directions and maintain appropriate Material Safety Data Sheets (MSDS).
- Calibrate application equipment according to University of Illinois Extension and/or manufacturer recommendations before each seasonal use and with each major chemical change.
- Replace worn nozzle tips, cracked hoses, and faulty gauges.
- Locate mixing/loading, storage, and supply tanks at least 150 feet away from wells, surface water, and down slope from wells.
- Pesticides used in chemigation shall be labeled for this method. Chemigation systems must be fitted with an anti-siphon device to prevent back flow.
- Maintain records of pest management for at least two years. Pesticide application records for restricted use pesticides shall be in accordance with USDA Agricultural Marketing Service's Pesticide Record Keeping Program. For additional information on record keeping contact:

U.S. Department of Agriculture,

Pesticide Records Branch,

8700 Centreville Road, Suite 202,

Manassas, VA 20110,

Phone: (703) 330-7826

Fax (703) 330-6110

TABLE I – Mitigation Effectiveness Guide - Reducing Pesticide Impacts on Water Quality

The NRCS Pest Management Practice Standard (595) requires environmental risk evaluation and appropriate mitigation for all identified resource concerns. The table identifies pest management mitigation measures for water quality. The mitigation measures include management techniques and conservation practices. Not all techniques will be applicable to a given situation. Mitigation techniques are rated for positive (shown as a "+," "++," or "+++") or negative (shown as a "-", "--," or "---") effects. Ratings with a single "+" or "-" show slight effects. Ratings with double characters show moderate effects. Ratings with triple characters show significant effects. Effectiveness ratings not having entries (blank) show no effects. These positive and negative effects must be relative to the site conditions.

The table also describes the function and relative effectiveness of techniques and practices for pesticide loss based on pathway. Effectiveness of any mitigation technique can be highly variable based on site conditions and application of the management techniques or conservation practices. Therefore, with guidance provided by the table, site-specific selection and design of mitigation techniques that are appropriate for identified resource concerns is left to the professional judgment of the conservation planner.

Pest Management Mitigation Techniques for Water Quality	Relative Effectiveness Rating by Pesticide Loss Pathways			Description of Mitigation Techniques and Conservation Practices Function
	Leaching	Solution Runoff	Adsorbed Runoff	
Management Techniques ^{1/}				
Application Timing	+++	+++	+++	Reduces exposure potential - delaying application when significant rainfall events are forecast can reduce pesticide transport to ground and surface water, application when conditions are optimal can reduce the amount of pesticide applied, also delaying application when wind speed is not in accordance with label requirements can reduce pesticide drift to surface water
Formulations/Adjuvants	++	++	+	Some formulations can reduce hazard associated with offsite movement. Consult with Extension personnel or consultants to determine if a formulation change can reduce hazards.
Lower Application Rates	+++	+++	+++	Reduces exposure potential - use lowest effective rate
Partial Treatment	+++	+++	+++	Reduces exposure potential - spot treatment, banding and directed spraying reduce amount of pesticide applied
Pesticide Label Environmental Hazard Warnings.	Required ^{2/}	Required ^{2/}	Required ^{2/}	Reduces exposure potential - label guidance must be carefully followed for pesticide applications near water bodies and on soils that are intrinsically vulnerable to erosion, runoff, or leaching
Scouting and Integrated Pest Management (IPM) Thresholds	+++	+++	+++	Reduces exposure potential - reduces the amount of pesticide applied
Set-backs	+	++	+	Reduces exposure potential - reduced application area reduces amount of pesticide applied, can also reduce inadvertent pesticide application and drift to surface water
Soil Incorporation – mechanical or irrigation	---	+++	+++	Reduces exposure potential for surface losses, but increases exposure potential for leaching losses
Substitution – ▪ Alternative pesticides ▪ Cultural controls ▪ Biological controls	+++	+++	+++	Reduces hazard potential - use alternative pesticides with low environmental risk, substituting cultural (including burning and mechanical controls) and biological controls can reduce the need for pesticides

Pest Management Mitigation Techniques for Water Quality	Relative Effectiveness Rating by Pesticide Loss Pathways			Description of Mitigation Techniques and Conservation Practices Function
	Leaching	Solution Runoff	Adsorbed Runoff	
Conservation Practices ^{3/}				
Alley Cropping (311)	+	+	++	Increases infiltration and uptake of subsurface water, reduces soil erosion, can provide habitat for beneficial insects which can reduce the need for pesticides, also can reduce pesticide drift to surface water
Anionic Polyacrylamide (PAM) Erosion Control (450)	-	+	+++	Increases infiltration and deep percolation, reduces soil erosion
Brush Management (314)	+++	+++	+++	Using non-chemical brush control often reduces the need for pesticides, pesticide use requires environmental risk analysis and appropriate mitigation - see Pest Management (595)
Conservation Cover (327)	+++	+++	+++	Retiring land from annual crop production often reduces the need for pesticides, builds soil organic matter
Constructed Wetland (656)	+	+	++	Captures pesticide residues and facilitates their degradation
Conservation Crop Rotation (328)	++	++	++	Reduces the need for pesticides by breaking pest lifecycles
Contour Buffer Strips (332)		++	++	Increases infiltration, reduces soil erosion
Contour Farming (330)	-	+	+	Increases infiltration and deep percolation, reduces soil erosion
Contour Orchard and Other Fruit Area (Ac.) (331)	-	+	+	Increases infiltration and deep percolation, reduces soil erosion
Contour Stripcropping (585)		++	++	Increases infiltration, reduces soil erosion
Cover Crop (340)	+	+	++	Increases infiltration, reduces soil erosion, builds soil organic matter
Deep Tillage (324)	-	+	+	Increases infiltration and deep percolation
Dike (356)	++/--	++	++	Reduces exposure potential - excludes outside water (++ leaching) or captures pesticide residues and facilitates their degradation (-- leaching)
Diversion (362)	+	+	+	Reduces exposure potential - water is diverted
Drainage Water Management (554)	++/--	++	++	Seasonal saturation may reduce the need for pesticides, drainage reduces storm water runoff, drainage increases infiltration and aerobic pesticide degradation in the root zone during the growing season (++ leaching), seasonal saturation may bring the water table in contact with pesticide residues from the previous growing season (-- leaching)
Field Border (386)		+	++	Increases infiltration and traps adsorbed pesticides, often reduces application area resulting in less pesticide applied, can provide habitat for beneficial insects which reduces the need for pesticides, can provide habitat to congregate pests which can result in reduced pesticide application, also can reduce inadvertent pesticide application and drift to surface water
Filter Strip (393)		++	+++	Traps adsorbed pesticides, increases infiltration, and promotes biological and chemical degradation of pesticides in the root zone. Can provide habitat for beneficial insects reducing the need for pesticides. Can reduce inadvertent pesticide application and drift to surface water by serving as a setback zone.

Floodwater Diversion (400)	+	+	+	Reduces exposure potential - floodwater is diverted
Pest Management Mitigation Techniques for Water Quality	Relative Effectiveness Rating by Pesticide Loss Pathways			Description of Mitigation Techniques and Conservation Practices Function
	Leaching	Solution Runoff	Adsorbed Runoff	
Forage Harvest Management (511)	++	++	++	Reduces exposure potential - timely harvesting reduces the need for pesticides
Forest Stand Improvement (666)	++	++	++	Reduces the potential for pest damage and the need for pesticides
Grade Stabilization Structure (410)			++	Traps adsorbed pesticides
Grassed Waterway (412)		+	++	Increases infiltration and traps adsorbed pesticides (should be applied with Filter Strips at the outlet and on each side of the waterway)
Hedgerow Planting (442)			(+) 4/	Reduces adsorbed pesticide deposition in surface water, also can reduce inadvertent pesticide application and drift to surface water
Herbaceous Wind Barriers (603)			(+) 4/	Reduces wind erosion, traps adsorbed pesticides, can provide habitat for beneficial insects which reduces the need for pesticides, can provide habitat to congregate pests which can result in reduced pesticide application, also can reduce pesticide drift to surface water
Irrigation Land Leveling (464)	++	+	++	Reduces exposure potential - uniform surface reduces pesticide transport to ground and surface water
Irrigation System, Microirrigation (441)	++	+++	+++	Reduces exposure potential - efficient and uniform irrigation reduces pesticide transport to ground and surface water
Irrigation System, Sprinkler (442)	++	++	++	Reduces exposure potential - efficient and uniform irrigation reduces pesticide transport to ground and surface water
Irrigation System, Surface and Subsurface (443)	+	+	+	Reduces exposure potential - efficient and uniform irrigation reduces pesticide transport to ground and surface water
Irrigation System Tail Water Recovery (447)		+++	+++	Captures pesticide residues and facilitates their degradation
Irrigation Water Management (449)	+++	+++	+++	Reduces exposure potential - water is applied at rates that minimize pesticide transport to ground and surface water, promotes healthy plants which can better tolerate pests
Mulching (484)	+	+/-	+/-	Often reduces the need for pesticides, natural mulches increase infiltration and reduce soil erosion (+ solution and adsorbed runoff), artificial mulches may increase runoff and erosion (- solution and adsorbed runoff)
Nutrient Management (590)	++	++	++	Promotes healthy plants which can better tolerate pests
Pasture and Hay Planting (512)	++	++	++	Retiring land from annual crop production often reduces the need for pesticides, builds soil organic matter
Prescribed Burning (338)	++	++	++	Often reduces the need for pesticides
Prescribed Grazing (528A)	++	++	++	Improves plant health and reduces the need for pesticides
Recreation Area Improvement (562)	++	++	++	Increases infiltration and uptake of subsurface water, reduces soil erosion, builds soil organic matter
Residue Management, No-till and Strip-Till (329A)	+	++	+++	Increases infiltration, reduces soil erosion, builds soil organic matter
Residue Management,	+	++	+++	Increases infiltration, reduces soil erosion, builds soil

Mulch-Till (329B)				organic matter
Pest Management Mitigation Techniques for Water Quality	Relative Effectiveness Rating by Pesticide Loss Pathways			Description of Mitigation Techniques and Conservation Practices Function
	Leaching	Solution Runoff	Adsorbed Runoff	
Residue Management, Ridge Till (329C)	+	++	+++	Increases infiltration, reduces soil erosion, builds soil organic matter
Residue Management, Seasonal (344)	+	+	+	Increases infiltration, reduces soil erosion, builds soil organic matter
Riparian Forest Buffer (391)	+	+++	+++	Increases infiltration and uptake of subsurface water, traps sediment, builds soil organic matter
Riparian Herbaceous Cover (390)	+	++	++	Increases infiltration, traps sediment, builds soil organic matter
Sediment Basin (350)			++	Captures pesticide residues and facilitates their degradation
Stripcropping, Field (586)		+	+	Increases infiltration, reduces soil erosion
Structure For Water Control (587)	-	++	+++	Captures pesticide residues and facilitates their degradation, increases infiltration and deep percolation
Subsurface Drainage (606)	+	++	++	Increases infiltration and aerobic pesticide degradation in the rootzone *Note – avoid direct outlets to surface water
Surface Drainage, Field Ditch (607)	+	+	+	Increases infiltration and aerobic pesticide degradation in the rootzone
Terrace (600)	--	++	+++	Increases infiltration and deep percolation, reduces soil erosion
Tree and Shrub Establishment (612)	+++	+++	+++	Retiring land from annual crop production often reduces the need for pesticides, increases infiltration and uptake of subsurface water, builds soil organic matter
Waste Storage Facility (313)	+	++	++	Captures pesticide residues
Waste Treatment Lagoon (359)		+++	+++	Captures pesticide residues and facilitates their degradation
Waste Utilization (633)	++	++	++	Increases soil organic matter
Water and Sediment Control Basin (638)	-	++	+++	Captures pesticide residues and facilitates their degradation, increases infiltration and deep percolation
Well Decommissioning (351)	+++			Eliminates point source contamination
Wetland Creation (Ac.) (658)	+	+	+	Captures pesticide residues and facilitates their degradation
Wetland Enhancement (Ac.) (659)	+	+	+	Captures pesticide residues and facilitates their degradation
Wetland Restoration (Ac.) (657)	+	+	+	Captures pesticide residues and facilitates their degradation
Windbreak/Shelterbelt Establishment (380)			(++) 4/	Reduces wind erosion, reduces adsorbed pesticide deposition in surface water, traps adsorbed pesticides, also can reduce pesticide drift
Windbreak/Shelterbelt Renovation (650)			(++) 4/	Reduces wind erosion, reduces adsorbed pesticide deposition in surface water, traps adsorbed pesticides, also can reduce pesticide drift

^{1/} Additional information on pest management mitigation techniques can be obtained from Extension pest management publications, pest management consultants and pesticide labels.

^{2/} The pesticide label is the law - all pesticide label specifications must be carefully followed, including required mitigation. Additional mitigation may be needed to meet NRCS pest management requirements for identified resource concerns.

^{3/} Details regarding the effects of Conservation Practices on ground and surface water contamination by pesticides are contained in the Conservation Practice Physical Effects matrix found in the National Handbook of Conservation Practices.

^{4/} Mitigation applies to adsorbed pesticide losses being carried to surface water by wind.